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ABSTRACT

The increased demand for library materials resulting from improved bibliographic access due to automation, and auditors' demands for more accurate accounting of library assets/holdings, have made it increasingly important that the discrepancy between the catalog and the materials in the stacks be reduced. This paper identifies many of the benefits associated with an extensive shelf inventory project in large academic and research libraries. It also describes how to determine many of the associated costs and provides a set of procedures with flowcharts. Topics covered include: types of inventories; conducting a pilot inventory; conducting an inventory (developing inventory procedures, in-stack inventories, out-of-stack inventories, search procedures, and record-keeping and statistics); and concluding remarks. Examples from an inventory conducted at the University of Kansas illustrate the procedures, and results of a survey of Association of Research Libraries (ARL) institutions are cited. A selected bibliography concludes the paper. (THC)

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# A Guidebook For Shelf Inventory Procedures In Academic Libraries

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Occasional Paper Number 10
July 1985

Office of Management Studies
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# A Guidebook For Shelf Inventory Procedures In Academic Libraries

Occasional Paper Number 10
July 1985

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EDITOR'S NOTES:

This is one of a series of Occasional Papers from the Office of Management Studies (OMS), Association of Research Libraries. Occasional Papers provide in-depth analyses of management and operational issues of current interest to academic and research library administrators and staff. They supplement the regular (ten times per year) SPEC Kits/Flyers from the Office, which provide two-page analyses and documents related to research library concerns. Complete listings of all Occasional Papers and SPEC Kits/Flyers are available from the OMS.

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* * * *

Mr. Haka and Ms. Stevens are participants in the OMS Collaborative Research/Writing Project, which enables working librarians to prepare publications cooperatively with OMS staff.

## ABSTRACT

Over the past several decades, academic libraries have increased their holdings, introduced automated procedures and catalogs, and enhanced user access to materials. With such changes, it has become increasingly difficult to maintain a reasonable correspondence between the holdings as represented by the public catalog and the materials on the shelf. Reducing the discrepancy between the catalog, whatever its form, and the materials on the shelf is what an inventory seeks to do.

The enormity of an inventory project frequently discourages large libraries from considering such an undertaking, despite possible benefits. This paper identifies many of these benefits, describes how to determine many of the costs, and provides a set of procedures with flowcharts. Examples from an inventory conducted at the University of Kansas illustrate the procedures, and results of a survey of ARL institutions are cited. A selected bibliography concludes the paper.

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## INTRODUCTION

Automation, in the form of citation databases, online catalogs, and keyword indexes, is dramatically increasing the ability of library users to obtain references to materials they need. However, libraries also must provide reasonable access to that material in order to satisfy users.

Automation has lent important assistance in two areas of document retrieval. First, interlibrary loan operations are being streamlined by modern communication systems that minimize the time required to locate and transmit facsimile reproductions of desired articles. Second, automated circulation systems are now capable of providing excellent control over materials that are away from the shelf. This is, however, where the success story ends. What remains is the bulk of the collection that the circulation system suggests is "on the shelf." Unfortunately, this is frequently not the case. The maintenance of bookstacks remains mostly in the dark ages, unaided by automation and largely ignored. As the demand for materials increases because of improved bibliographic access, and as auditors begin to demand a more accurate accounting of library assets/holdings, it is increasingly important that the discrepancy between the catalog and materials in the stacks be reduced.

Reducing this discrepancy, however large or small, is what an inventory seeks to accomplish. This paper, which expands on a "Research Notes" article in the March 1985 issue of College and Research Libraries, focuses on one set of procedures for conducting an efficient inventory. It also provides a short review of main types of inventories and an assessment of the cost/benefits of an inventory.

## TYPES OF INVENTORIES

There are essentially two types of inventories -- those conducted in the bookstacks, thereby allowing for direct visual verification/inspection of the physical item, and those conducted away from the bookstacks, which by necessity must employ a surrogate representation of items in the stacks, such as a circulation system database.

Modern technology certainly has and will continue to offer alternatives and/or modifications to this somewhat arbitrary delineation of "in" and "out" of stack inventories. For example, if a library had its entire collection bar coded for circulation purposes, it would be possible to use a portable reader to enter all the bar codes of items on the shelf, reduce this list by the items checked out, and thereby produce a "missing" items list. For purposes of discussion, however, this paper will emphasize the most common practices, as specialized inventory procedures depend almost entirely on the automation/collection conversion situation at the specific library. For an example, see "Microcomputers for Information Management" (March 1984).

## IN-STACK INVENTORIES

The traditional style of inventory is typically conducted by taking the shelflist (drawers of 3 x 5 cards, arranged by catalog number) into the stacks and comparing the items on the shelf to successive cards. Two basic categories of problems are encountered. The first and most frequent is a shelflist card for which no corresponding item is found on the shelf. (Flowchart 1) The second basic problem is an item on the shelf for which there is no corresponding shelflist card. (Flowchart 2)

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INSERT FLOWCHARTS 1 AND 2

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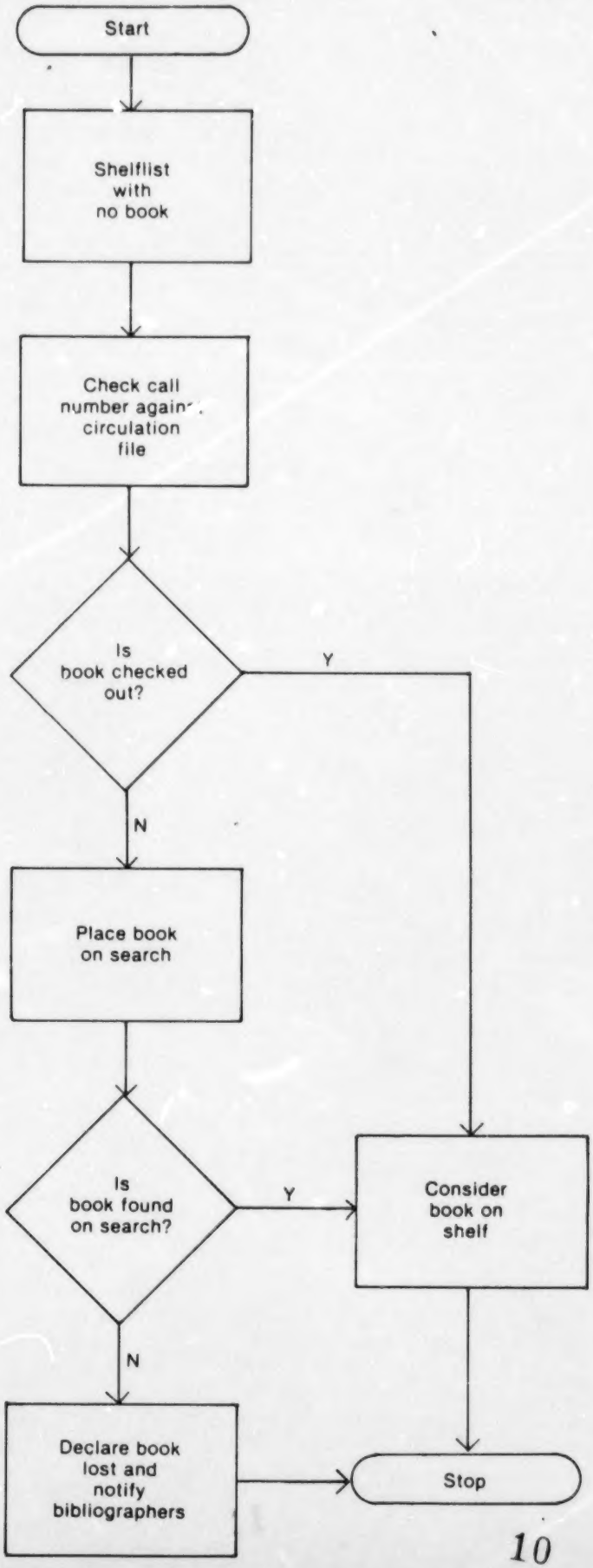
Conducting an inventory in the stacks does not require that the traditional card shelflist be used if there is an alternative. If the catalog is automated, a computer printout or hand-held microcomputer loaded with all or part of the records may be substituted for the shelflist cards. The advantage of such an alternative depends upon the extra information

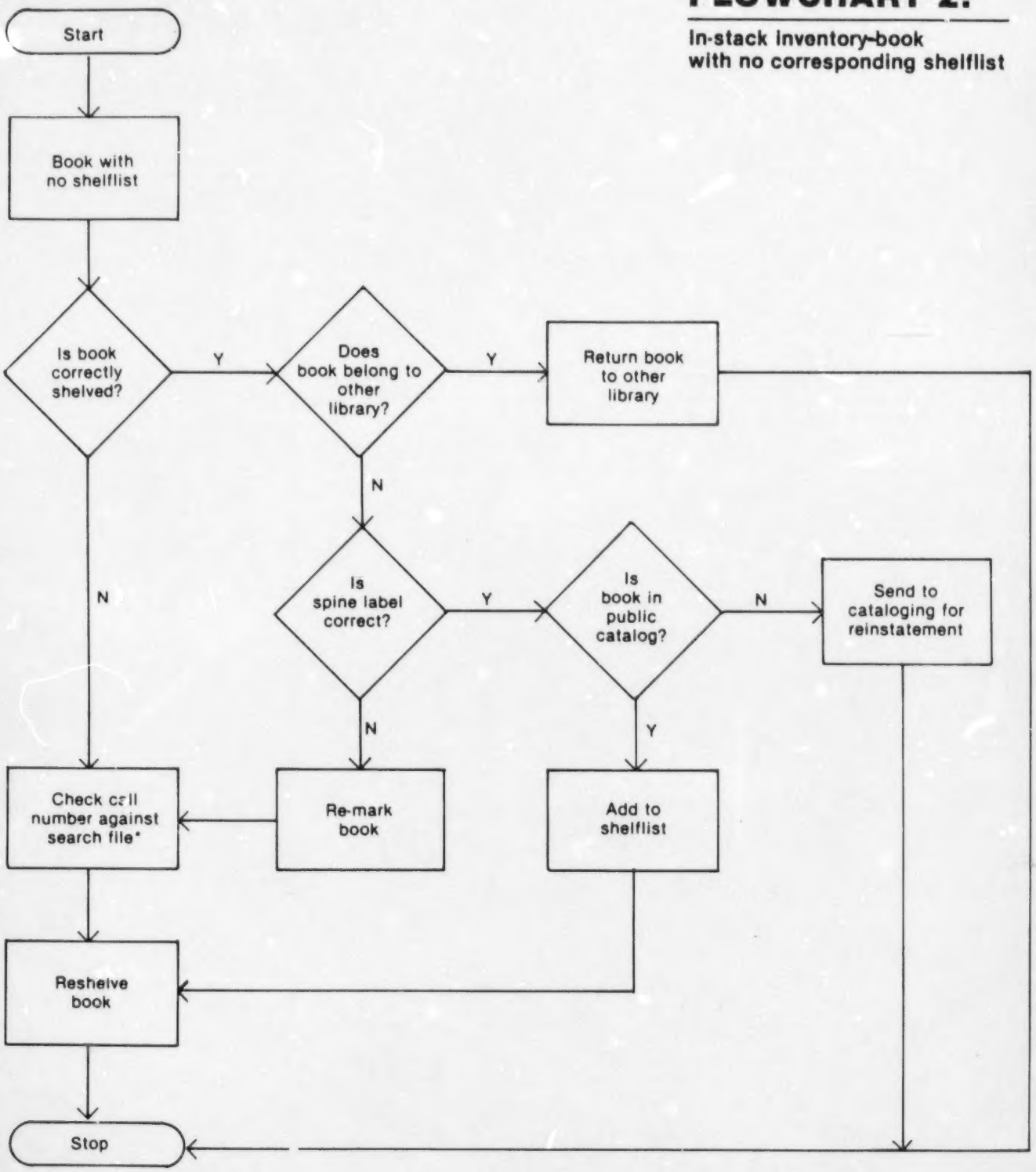
## FLOWCHART 1:

**In-stack inventory-shelflist with no corresponding book**



# FLOWCHART 2:

**In-stack inventory-book with no corresponding shelflist**




*Required only if call number is from an area already inventoried.

contained in the alternative source. For example, an alternative source might include serial holdings information that a traditional shelflist would not. This would allow for verification of specific volume holdings as opposed to the simple existence of at least one item at the particular call number.

Whatever form of shelflist is used, the in-stack method offers at least the following benefits:

1. Identification of missing materials
2. Identification of materials for which there is no shelflist entry and subsequently, in many cases, no entry in the public catalog
3. Identification of materials not belonging to the collection
4. Identification of materials in the wrong library location (e.g., branch books in main library stacks)
5. Identification of mismarked materials
6. Identification of misshelved materials

If desired, this method also allows for:

7. Visual inspection of each item on the shelf for possible re-marking or repair
8. Examination of multiple copies for potential weeding
9. Summary data for collection development analysis

## OUT-OF-STACK INVENTORIES

With the advent of automation, a second type of inventory has become possible. Many libraries, in developing automated bibliographic databases, create a second record of the holdings in call number order. If the physical existence is verified at the time of the conversion to the automated system (the presence of materials required to attach an OCR or bar code label, for example), the database can serve as a representation of the physical holdings.

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INSERT FLOWCHARTS 3 AND 4

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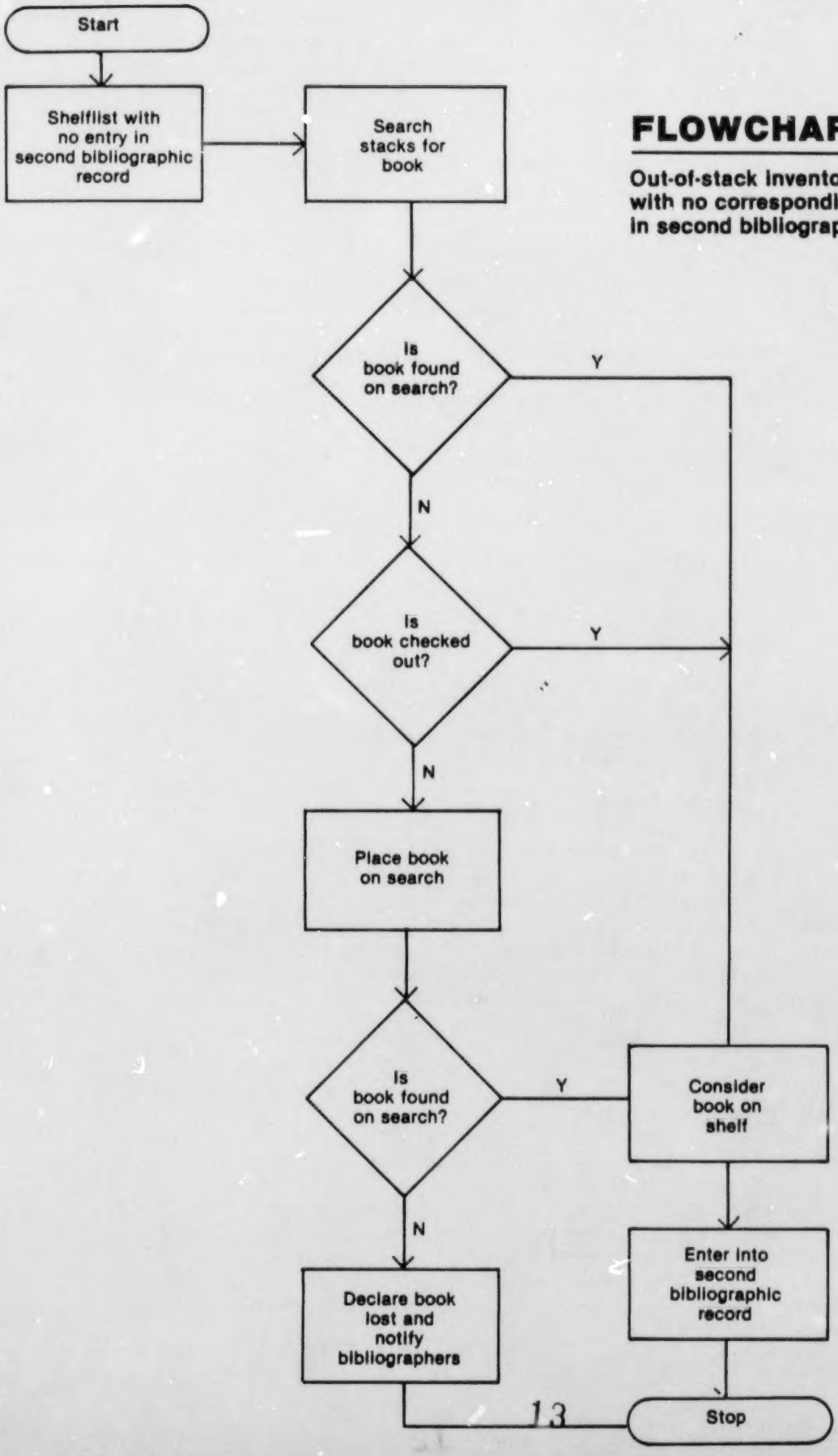
In this case, the first phase of the inventory can be performed by matching the shelflist (manual or automated) against the bibliographic database. (Flowchart 3) On comparing the shelflist to this file, one can determine missing items (at least items that were missing, or missed, during the process that generated the surrogate representation),

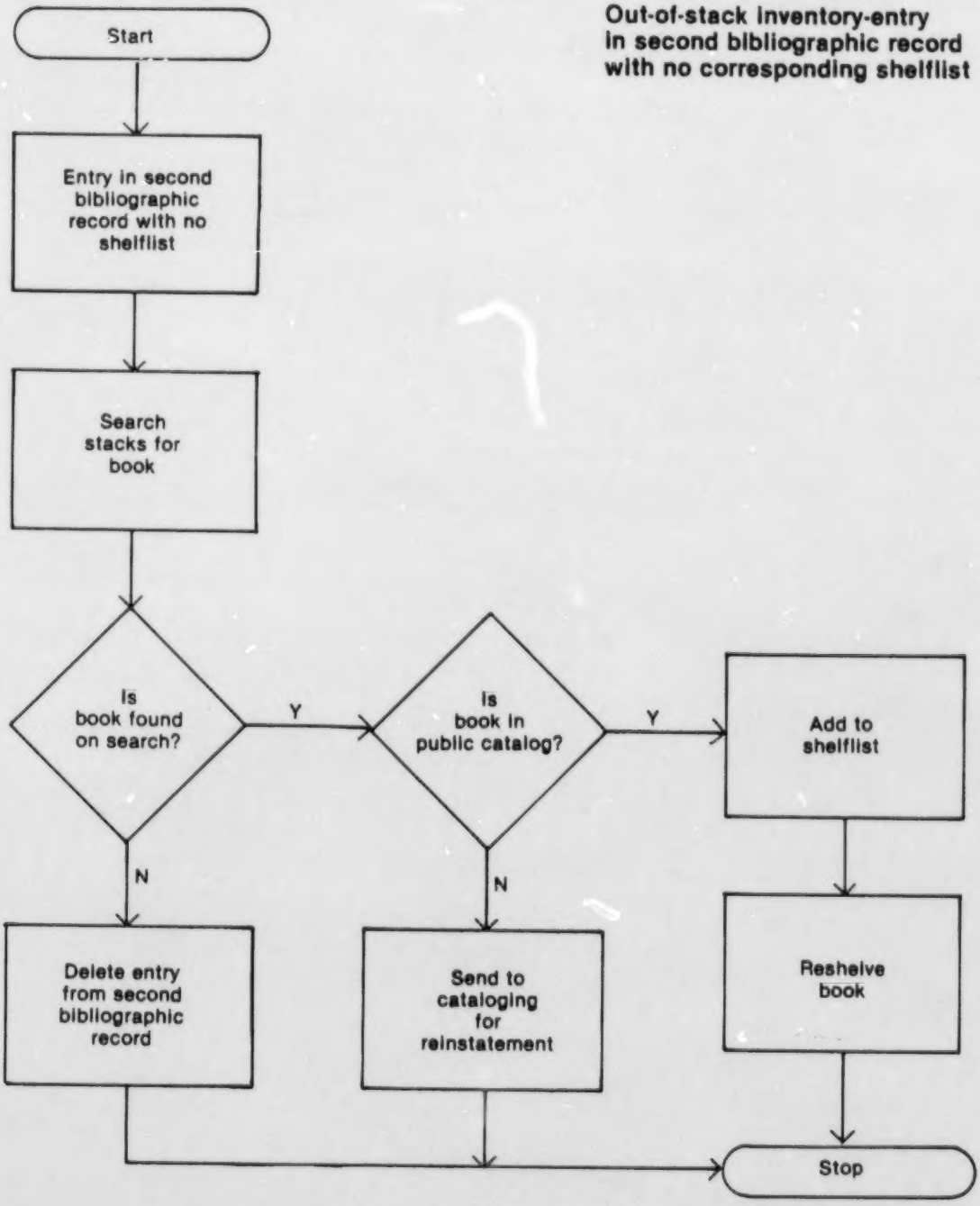



## FLOWCHART 3:

**Out-of-stack inventory-shelflist with no corresponding entry in second bibliographic record**

## FLOWCHART 4:

**Out-of-stack inventory-entry in second bibliographic record with no corresponding shelflist**



and items on the file for which there is no shelflist entry. (Flowchart 4) The shelves are then checked to eliminate discrepancies resulting from errors in the bibliographic database. The out-of-stack method offers only the first two benefits from the preceding list:

1. Identification of missing materials

2. Identification of materials for which there is no shelflist entry and subsequently, in many cases, no entry in the public catalog

The other byproduct resulting from this type of inventory is the correction of information on the second bibliographic record.

## ASSESSING THE OPTIONS: IN-STACK VS. OUT-OF-STACK INVENTORIES

If the library does not have an alternative source to represer what is on the shelf, then an in-stack inventory is the only option available. If the library does have a database that could be used in lieu of in-stack inspection, then the choice is between a speedier out-of-stacks procedure that cannot incur benefits 3 through 8, or a slower process that can reap any or all of these additional results. The most objective basis for making a decision is to conduct a pilot inventory for each method. Doing a sample of the shelflist also simplifies projecting costs and benefits for a comprehensive inventory. Libraries that require assistance in determining an appropriate sample size can consult a statistics textbook that explains how to do standard deviation calculations. The sample size will be determined to a large extent by the degree of accuracy the library desires for its estimate. In many cases, preliminary findings will make it quite clear whether an inventory is required, due to either high error rates or the lack thereof.

## CONDUCTING A PILOT INVENTORY

Procedures for conducting an inventory outlined in Section 2 of this paper also are applicable for pilot inventories. The drawers used for the sample should be in an average-use area: circulation statistics, if available, should guide this choice. When the pilot inventory is conducted, it is critically important to keep a detailed account of exactly what has occurred. To begin, personnel hours should be recorded, broken down for each activity conducted. For example, the number of hours required to read a section of the shelflist, the number of hours required to check missing items against the circulation record. This will allow an accurate assessment of the real cost to the institution, because some of the tasks, such as checking items against the circulation record, might be assigned to existing desk staff who are not otherwise occupied during slow hours, thereby resulting in no real additional cost to the library.

It is important that the time required to record the time necessary for each task not be included in the estimate of total time required to conduct the inventory. In addition, it is safe to assume that this trial will generate unforeseen difficulties that require the individuals involved to decide among various courses of action. Time spent in this fashion should also be disregarded. A final concern about the time required is that the individuals conducting the trial will be new to the procedures and, therefore, necessarily slower than the individuals who will conduct the project as they become accustomed to the various tasks involved. The impact of this learning curve is, of course, impossible to gauge with great accuracy, but staff assigned to an inventory project at the University of Kansas were able to decrease the time required for two people to read a shelflist drawer by approximately 40 percent, from five hours to three hours.

Whereas the costs of discovering errors are a part of the inventory, the costs of correcting errors are not. For example, determining that an item is mismarked is reflected in the inventory cost, but the correction of that error is an additional cost to the institution and requires the cooperation of other departments. Because the inventory may very well raise problems that require attention by other departments -- such as cataloging for processing of lost materials -- obtaining administrative support for such activities is a necessary first step before undertaking an inventory.

## PROJECTING PERSONNEL COSTS

After the number of hours per shelflist section for each task is determined, a personnel cost figure can be generated by multiplying by the hourly personnel cost of the staff member who will be performing that function. For example:

Reading a drawer in the stacks

1 clerical employee
3 hours x $6.00/hour = $18.00

1 student assistant
3 hours x $4.00/hour = $12.00

Cost of reading a drawer = $30.00

(The cost figures listed here are for example only; actual personnel costs will vary from institution to institution.)

Naturally the decision of whether to use student assistants, clerical staff, paraprofessionals, or librarians will drastically alter the costs incurred. The inventory conducted at the University of Kansas did not involve librarians except in initial design, monitoring, and occasional input on special cases.

## COST/BENEFIT ANALYSIS

Once the costs are calculated, they can be compared to the number of problems encountered and corrected. Some categories of problems may take more time to correct than they are worth. For example, if an aggressive conservation program has been ongoing, readers might not find many items requiring repair. This step could be deleted, thereby eliminating the time required to inspect items for possible repair. Procedures such as this can be deleted from the suggested program to produce a more cost-effective process. For both in-stack and out-of-stack inventories conducted at the University of Kansas, the cost per discovery of a "critical error" (an error that prohibits the users from locating the material but not including minor misshelving) was approximately $1.00 per error.

In the final analysis, someone will face the question of "how much is it worth to correct problems before they come up in normal use?" Answers to this question vary drastically. In a 1980 survey of ARL institutions regarding inventory practices, one response concluded that "inventory related problems come up in normal use and are resolved at that time."* To some extent this may be true. Slightly misshelved items frequently are found by staff members when users seek assistance. But many users may not

*In 1980 all Association of Research Libraries (ARL) member libraries were sent a questionnaire concerning their inventory history. Sixty-one libraries responded. The questionnaire and a summary of the responses are provided in Appendix A.

request a search. Furthermore, shelfreading will not find mismarked items; items for which there are no cards in the catalog will not be discovered, nor will those that are lost and for which the user must wait to process an interlibrary loan request until the library completes a search for the item. These are but a few problems that will not naturally be called to the attention of the staff. Considerations such as these prompted another ARL respondent to note, "I can't imagine the hidden chaos which would persist forever without inventory."

Are libraries that do not inventory simply burying their heads in the sand and pretending that chaos cannot exist? During busy times of the year a large academic library will receive search requests for well over 100 items per week and frequently for several hundred items. It is also likely that only a few of the users who do not find an item in the stacks will carry through to the point of requesting a staff search. It is quite likely, if not certain, therefore, that literally hundreds of users per week are meeting with frustration in the stacks above and beyond that generated by normal circulation of desired materials. It is this largely unquantified situation that must be factored into the cost/benefit analysis in some manner.

If it appears that a comprehensive inventory cannot or will not be undertaken, there are at least two less expensive alternatives that resolve some of the problems resolved by an inventory. The first is a partial inventory, typically conducted in the high-use areas of the collection. (See David F. Kohn, "High Efficiency Inventorying through Predictive Data," Journal of Academic Librarianship, V.8,N.2, pp. 82-84.) The other alternative is shelfreading, which puts the items on the shelf in order, but makes no attempt to discover errors beyond misshelving. Shelfreading is significantly less expensive because it requires only one individual, typically a student assistant. Before turning to one of these alternatives it might be prudent to consider the following obvious but critical fact. If the pilot inventory goes very slowly and is, therefore, judged to be prohibitively expensive, this is probably because a large number of errors was discovered, suggesting that an inventory is needed. It is more logical to reject an inventory when very few errors are discovered and the relative cost is low.

## CONDUCTING AN INVENTORY

### DEVELOPING INVENTORY PROCEDURES

If a decision is made to inventory, procedures will vary among libraries depending upon the format of available records. This section suggests various considerations to be taken into account when developing local procedures, describes basic steps in identifying and correcting discrepancies between the public catalog and the physical holdings, and provides specific examples from a case study.

### STREAMLINING WORK PROCEDURES

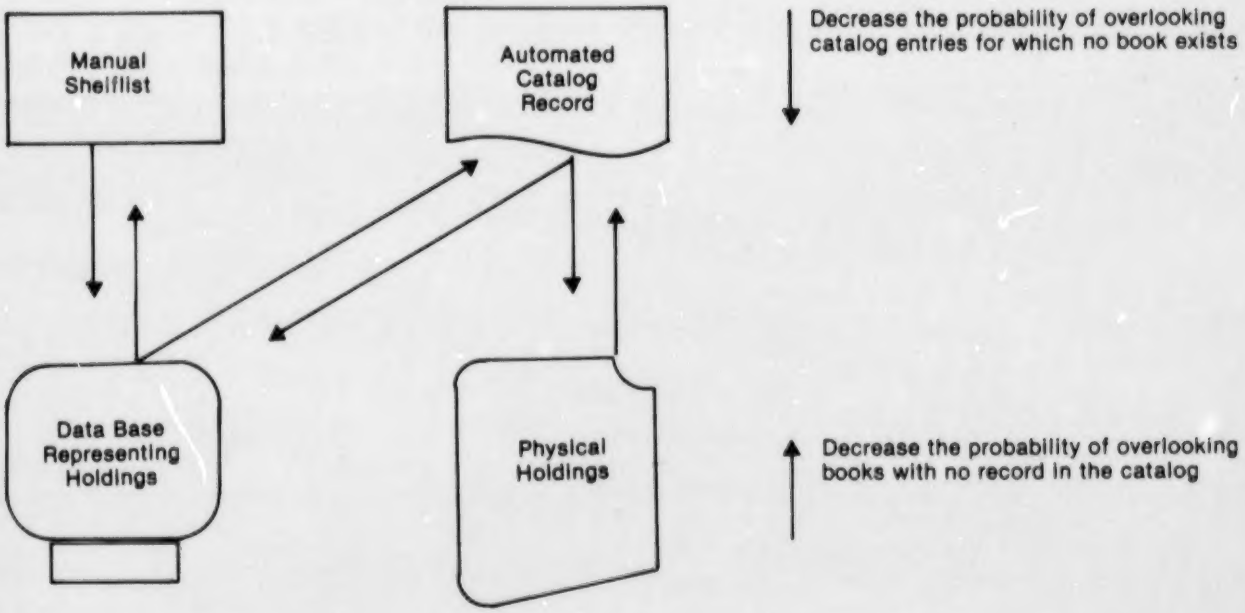
The survey of ARL members revealed that the majority of the respondents (both those who had and had not undertaken inventories) identified staff time required as the major disadvantage of an inventory. The basic tasks in an inventory are simple, but the number of repetitions of each task becomes problematic for large libraries. Streamlining simple procedures can, over many repetitions, add up to vital savings in staff time.

The primary task of inventory workers is to read the shelflist entries against the physical holdings or the bibliographic database that represents the holdings. All other tasks will interrupt the flow of this work and, consequently, have a major impact on the progress of the inventory. But, many types of interruptions are essential to achieve the desired results of the inventory. A major consideration in developing procedures should therefore be streamlining both the primary and the secondary tasks.

During the inventory, for example, books are pulled from the shelves for a variety of reasons. A method must be devised for identifying specific problems. Colored book flags can be inserted in the books to represent particular problems--red flags for books with no shelflist entry, green flags for branch library books, blue flags for books to be discarded, and so on. This eliminates the need for the inventory workers to stop and write notes or to re-identify problems once the books are out of the stacks. This method can be tailored to fit specific needs. For instance, if the library system includes a number of branches, a flag of one color can be used for all branch books. These books can be quickly separated once they are out of the stacks. If flags are used in other library processes, the inventory procedures can coordinate with these systems.

## Diagram 1

**Discrepancies in call number order:**
**selecting the record from which reading is done**



If the shelflist is traditional 3 x 5 inch cards, the rod can be removed from the drawer during the reading. When the workers come to a card with no corresponding book on the shelf or entry in the database that represents the holdings, the card is turned up in the drawer. Again, this eliminates the need to stop and write notes or to remove cards from the shelflist drawer. If the library considers it too risky to remove the rod, workers can use paper-clips to designate missing items, although this process is significantly slower.

## MISSHELVED BOOKS

If the initial phase of the inventory is performed in the stacks, misshelving will be corrected as the inventorying is done. However, if misshelving is a critical problem in the areas being inventoried, the work may come to a complete standstill while shelves are put in order. In this situation, it may be more economical to do shelfreading (which requires only one person) in advance of the inventory.

## COMPUTER SORTED CALL NUMBERS

Misfiled shelflist cards can be refiled and misshelved books reshelved to obtain an exact match between the shelflist entries and the books. A complication encountered with automated bibliographic records is computer sorting (or missorting) of call numbers that cannot be corrected. The extent of discrepancies between the call number order of the shelflist and the books on the shelves, or the shelflist and the bibliographic database representing the holdings, should be determined in advance. If there are discrepancies, the record from which the reading is done will affect the probability of overlooking critical errors. Diagram 1 illustrates the relationship between the record from which the reading is done and the probability of overlooking critical errors.

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INSERT DIAGRAM 1

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If call number discrepancies exist, the following three procedures will decrease the probability of overlooking catalog entries for which no book exists:

1. Reading from a manual shelflist to a bibliographic database that represents the holdings

2. Reading from an automated catalog record to the physical holdings

3. Reading from an automated catalog record to a bibliographic database that represents the holdings

The reverse of these procedures will decrease the probability of overlooking books with no record in the catalog:

1. Reading from a bibliographic database representing the holdings to a manual shelflist

2. Reading from the physical holdings to an automated catalog record

3. Reading from a bibliographic database representing the holdings to an automated catalog record

## IN-STACK INVENTORIES

### READING IN THE STACKS

The basic procedure for the inventory involves taking the shelflist to the stacks. As an example, an inventory of the Dewey-classified collection at the University of Kansas main library was undertaken in 1980 and 1981. This inventory was done in the stacks, matching the shelflist (drawers of 3 x 5 inch cards) against the items on the shelves. Reference will be made to the procedures used at the University of Kansas for illustrative purposes only. The specific procedures to be followed in any library will vary.

In addition to the shelflist, equipment includes a kick stool for reaching higher shelves, a booktruck or cart for books that must be pulled from the shelves, pencils if the procedures require making notations on the shelflist, and colored flags to identify problem books pulled from the shelves.

Flowchart 5 represents the tasks to be performed by inventory workers in the stacks.

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INSERT FLOWCHART 5

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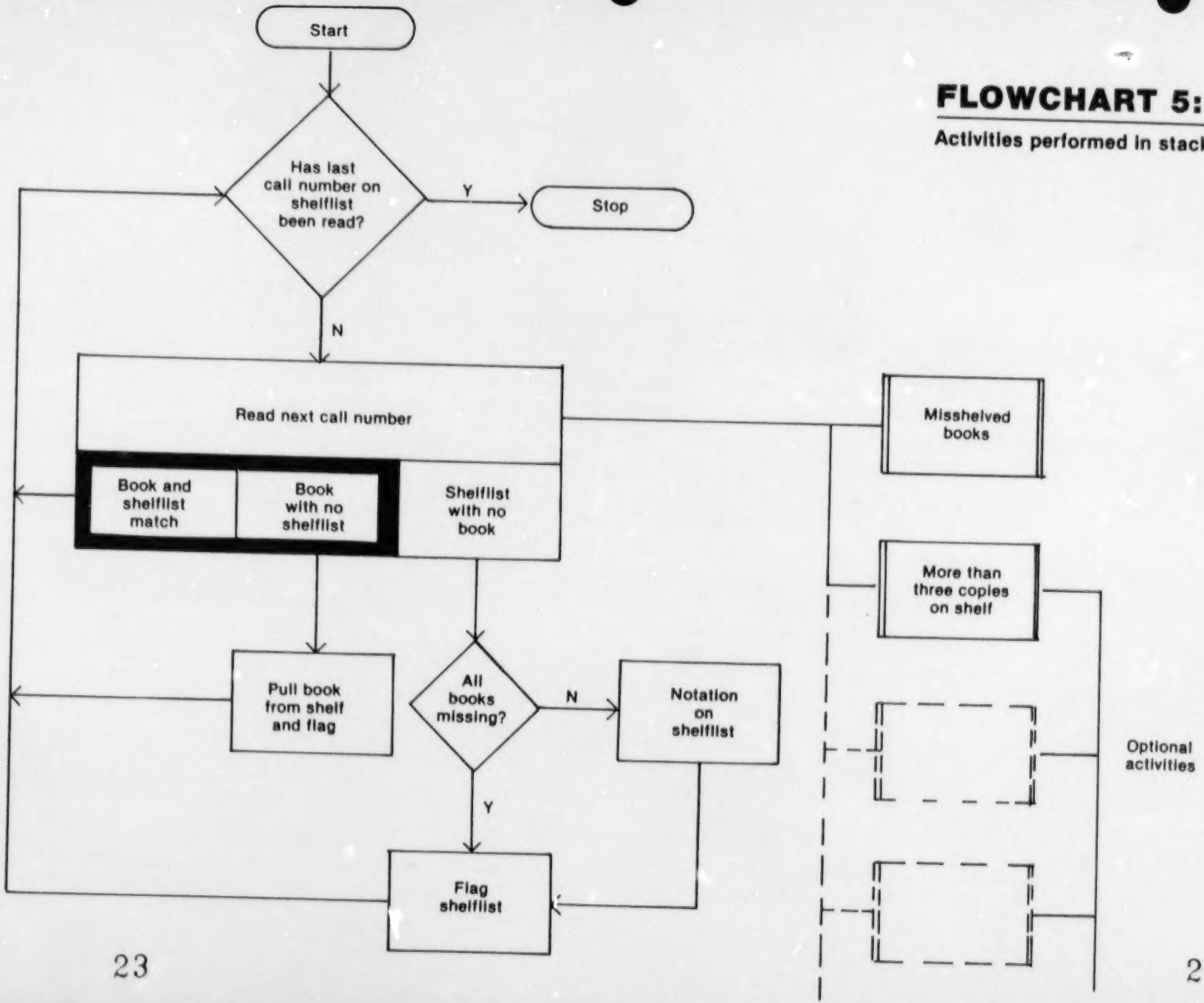
The shaded area indicates the primary task--reading the shelflist entries against the physical holdings. This requires two persons working together, and can be done adequately by student assistants or clerical employees. The process is least tiring and less susceptible to error if the workers alternate the reading of call numbers.

Work conducted in the stacks at the University of Kansas required an average of three hours per shelflist drawer (approximately 1,300 cards). The reading was usually performed by one clerk and one student assistant, who preferably completed a drawer in a single shift in the stacks.

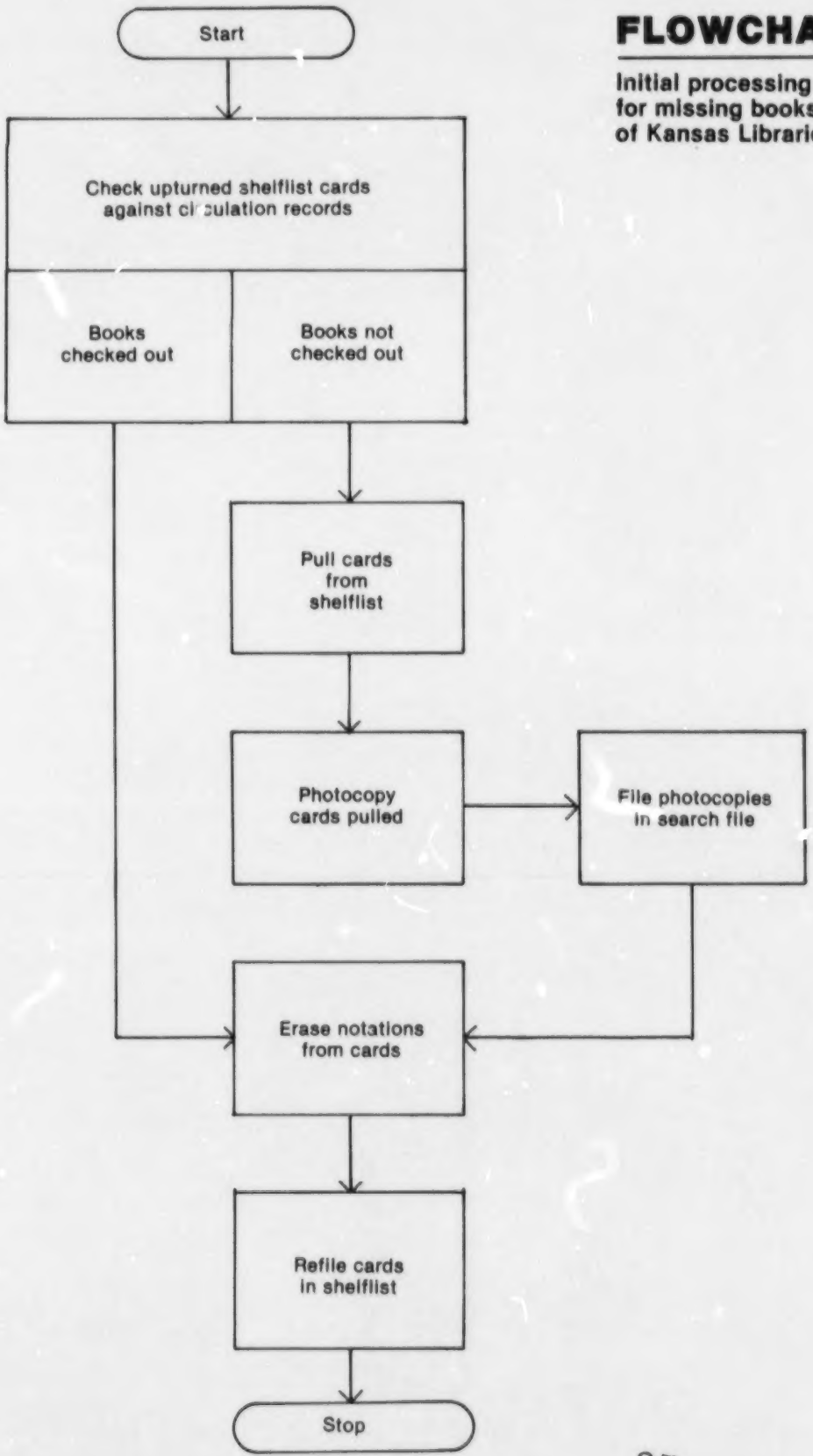
# FLOWCHART 5:

**Activities performed in stacks**



## FLOWCHART 6:

**Initial processing of shelflist for missing books at University of Kansas Libraries**



As the reading is done, misshelved books are encountered. Books out of place on the shelves being inventoried are corrected as the reading continues, and others pulled for reshelving. Although statistics for misshelved books were not kept during the inventory at the University of Kansas, this was undoubtedly the most common error encountered. Misshelved books were pulled from the shelves and placed on a booktruck with no identifying flags.

Books belonging in other libraries are considered a special case of misshelving. If the shelflist indicates that the book belongs in a branch library or a different location within the building -- such as reference-- the book is pulled from the shelf and flagged.

Books with no shelflist entry are one of the main discrepancies identified by an inventory. However, this situation creates a minimum interruption to the inventory work. The book is pulled from the shelf and flagged, and the reading continues.

Shelflist entries for missing books are the second major discrepancy identified by the inventory. If the library owns a single copy of the book, or the inventory is checking only for the presence of the title, the shelflist entry is flagged when there are no copies of the book on the shelf. If multiple copies of monographs are inventoried, missing copies are noted on the shelflist and the entry flagged.

Weeding of multiple copies of low-circulation titles was a secondary task performed by the inventory workers at the University of Kansas. This task was the most time-consuming of the interruptions to the primary task. If more than three exact copies of a title were on the shelf, the books were pulled from the shelf and their date-due slips examined. If total circulation in the past ten years was less than three, only three copies were reshelved. The remaining copies were flagged and put on the booktruck, and the shelflist entry noted.

## PROCESSING DISCREPANCIES

Processing discrepancies identified in the stacks is an ongoing part of the inventory. The first step in processing shelflist entries flagged because the books are not on the shelf is checking the circulation records. This should be done as soon as possible after the reading in the stacks, especially during times of the year when book returns are high. When the shelflist has been removed from the cataloging department, all processing that must be done before returning the records should be completed as soon as possible to reduce inconvenience, particularly for cataloging staff.

Flowchart 6 represents the initial steps in processing shelflist entries because the corresponding books were not on the shelf during the inventory of the University of Kansas Dewey-classified collection.

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INSERT FLOWCHART 6

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Shelflist cards for missing books in this example were flagged by turning them up in the drawer. Multiple copies of monographs were inventoried and pencil notations made on the shelflist cards to indicate missing copies.

Upturned cards were checked against an on-line circulation system. If a book was checked out, it was considered found and the card was turned down in the drawer. In the case of multiple copies, pencil notations on the card were erased. The remaining upturned cards (entries for missing books that were not checked out) were pulled from the drawer and photocopied. All remaining pencil notations were erased and the cards refiled. (In some libraries, pencil marks are left on the card for further assistance and reference, when agreeable to the cataloging department.) Flags placed in the drawer to mark the place for pulled cards expedited refiling. The photocopies of shelflist cards for missing books were placed in a file for later searching.

At least two categories of books are brought out of the stacks by the inventory workers--misshelved books (including those belonging in other libraries) and books for which there are no corresponding shelflist entries. Optional tasks may result in other categories of books being brought from the stacks, such as books to be rebound or discarded.

Misshelved books can be divided into two groups--those that belong on shelves that have already been inventoried and those that belong on shelves not yet inventoried. The latter group are entered into the return system and reshelved. Books that belong on shelves already inventoried may previously have been identified as missing by the inventory process. Once reshelved, a subsequent search will locate these books and records can then be corrected. But checking them immediately against the inventory search file will eliminate more time-consuming searching later. Branch library books are sorted and sent to the correct library.

Flowchart 7 represents the steps followed in processing books brought from the stacks because there are no corresponding entries in the shelflist.

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INSERT FLOWCHART 7

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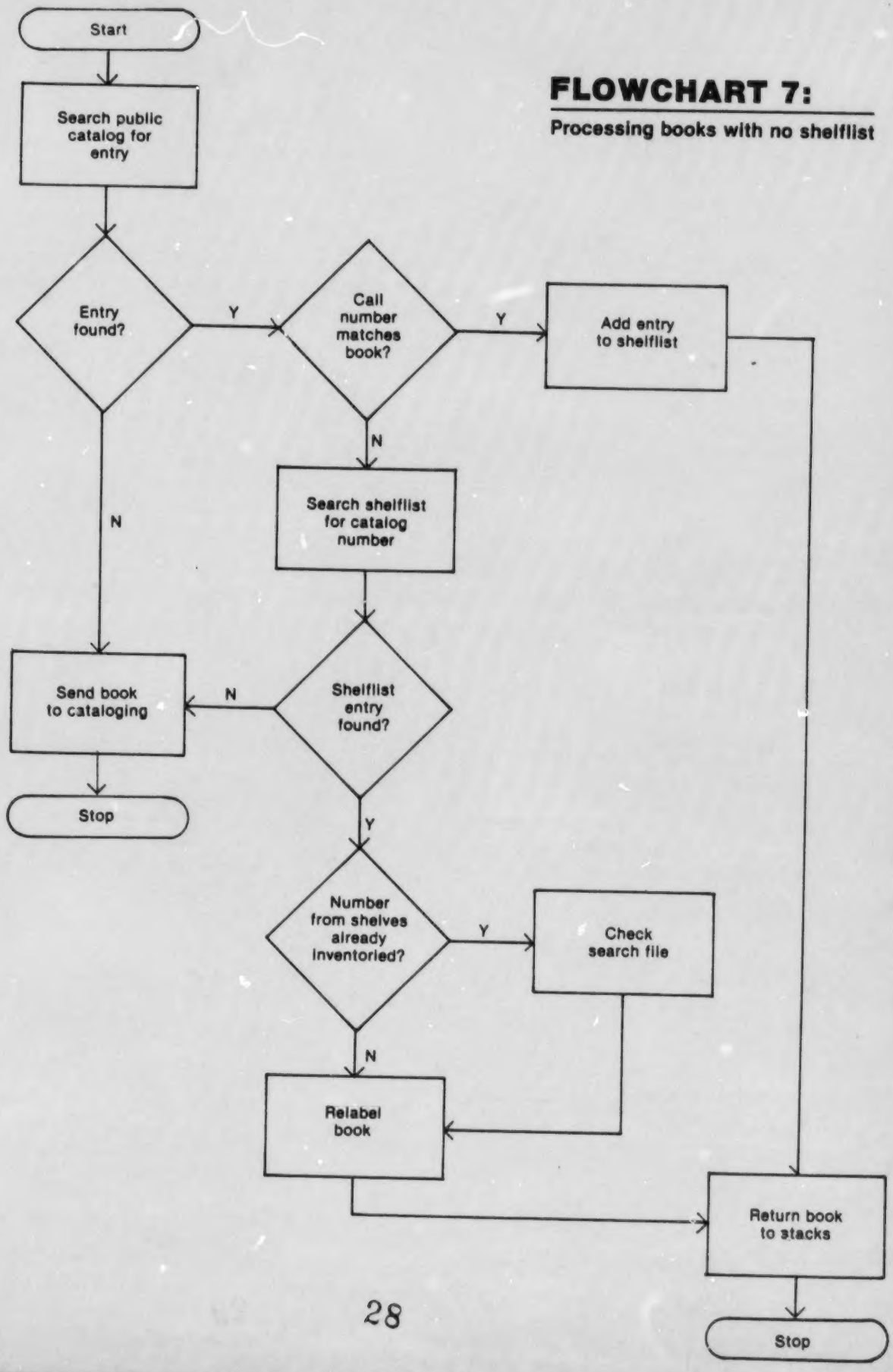
The first step in processing a book with no shelflist entry is to take the book to the public author/title catalog to search for an entry. Catalog maintenance staff can provide general instructions on identifying entry points on a title page. However, several searches under alternate entries should be made if an entry is not located on the first try. If no entry is located in the public catalog, the book is flagged and set aside to be sent to the cataloging department for reinstatement.

If an entry is located in the public catalog, the information is checked completely to assure that the entry corresponds to the book. If all the information corresponds exactly, the book is flagged to have an entry added to the shelflist.

## FLOWCHART 7:

**Processing books with no shelflist**



If all the information in the public catalog entry except the call number matches the book, the call number in the public catalog is noted. When the searching in the public catalog is complete, these books will be returned to the shelflist to search for an entry under the public catalog number. If no shelflist entry is found under the public catalog number, the book is flagged to be sent to cataloging. If a shelflist entry is found, it can be assumed that the spine label is incorrect, and the book is sent to processing to be relabeled. Books that belong on shelves already inventoried are checked against the inventory search file before being sent to processing.

Books pulled for discarding at the University of Kansas were reviewed by the circulation librarian, who sought bibliographers' advice as required. Since the shelflist cards had already been noted by the inventory workers when the books were pulled from the shelf, no further record-keeping was necessary unless it was decided to return a book to the collection. In this situation, the shelflist was corrected.

During the University of Kansas inventory, the time spent processing discrepancies was recorded by activity. A student assistant checked circulation records for shelflist entries flagged because the books were not on the shelf. This required an average of one and a half hours per shelflist drawer. Searching in the public catalog (a traditional card catalog divided into author/title and subject drawers) was done by a student assistant and required approximately thirty minutes per shelflist drawer. The remaining processing of books with no shelflist card (including preparing shelflist cards) was done by a clerical employee, requiring an average of one hour per shelflist drawer.

## OUT-OF-STACK INVENTORIES

The basic procedure for an out-of-stack inventory involves matching the shelflist against the bibliographic record that represents the holdings, and flagging discrepancies between the two records. As an example, an inventory of the Library of Congress (LC)-classified collection at the University of Kansas main library undertaken in 1981 was done at a CRT terminal, matching the shelflist (drawers of 3 x 5 inch cards) against the on-line circulation system database. In 1970, the University of Kansas had begun classifying materials under the LC system. In 1979, an on-line circulation system was introduced. Bibliographic records for new books received were added to the database from the time it became operational. LC-classified materials were retrospectively entered into the system. Adding a record to the on-line system entailed attaching an OCR label to the book. Consequently, the physical existence of the book was verified at the time of conversion. Two years later an inventory of the LC-classified collection was undertaken. The circulation database, it was determined, adequately reflected the physical holdings of the LC-classified collection--the physical existence of the materials had been verified within the past two years.

The circulation system had a browsing capability, allowing the user to scroll through the entire database in call number order. Twenty call numbers and partial titles were displayed on the terminal screen at one

time. The circulation system sorted call numbers correctly up to the volume/number designation. Therefore, discrepancies in call number order between the two records were encountered only with large series, and the probability of overlooking critical errors was small. Reading was done from the shelflist to the circulation database.

## COMPARING THE SHELFLIST TO A SECOND BIBLIOGRAPHIC RECORD

Other than the shelflist and second bibliographic record, equipment required for an out-of-stack inventory is minimal. Entries on both the shelflist and the second bibliographic record must be flagged. Any method of recording discrepancies, from writing down call numbers on P-slips to entering a code that automatically produces a computer report, may be used. Three considerations in selecting a method for recording discrepancies are 1) the extent of the interruption to the primary task of matching the entries on the two records, 2) the ease with which the flagged entries can be handled during the next step of the inventory -- searching in the stacks -- and 3) the ease of reproduction of information for search files and notification forms.

The product of the preliminary matching of the shelflist and the bibliographic record that represents the holdings is the identification of two types of discrepancies: (1) shelflist entries for which there is no corresponding entry in the second bibliographic record and (2) entries in the second bibliographic record for which there is no corresponding entry in the shelflist. These discrepancies represent catalog entries with no corresponding books on the shelves and books on the shelves with no record in the catalog, respectively.

## PROCESSING DISCREPANCIES

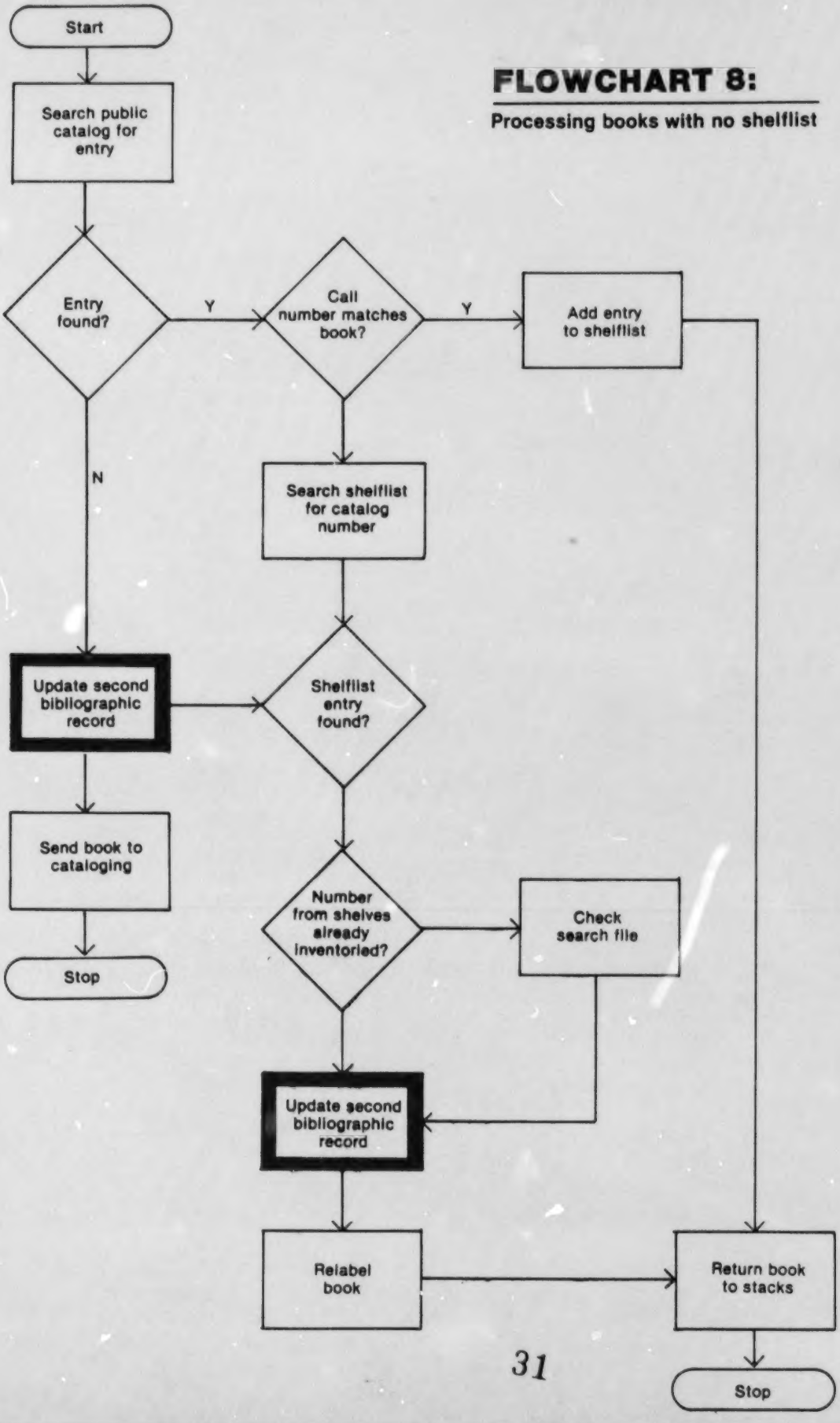
The second step in this type of inventory is to take both sets of discrepancies (in the form of lists of call numbers, copies of shelflist cards, etc.) to the stacks to search for the books. In most systems it will be necessary to retrieve the books, which requires a booktruck or cart. If only verification of the existence of the book is necessary to correct the discrepancy, a notation can be made on the record being used for searching. Otherwise, colored book flags can be used to distinguish books with no entry in the shelflist from books with no entry in the second bibliographic record.

Books found in the stacks with no entry in the second bibliographic record are added to that record and entered into the return system to be reshelved. The remaining flagged shelflist entries (no book in the second bibliographic record and no book found in the stacks) are placed in a search file.

Books found in the stacks with an entry in the second bibliographic record but no shelflist entry are taken to the public author/title catalog to search for an entry. The procedure followed is similar to that described under processing discrepancies for in-stack inventories

## FLOWCHART 8:

**Processing books with no shelflist**



(Flowchart 7) with additional steps for updating the second bibliographic record. Flowchart 8 outlines this procedure; the added steps are highlighted.

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INSERT FLOWCHART 8

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If an entry is found in the public catalog that matches the book exactly, the record is added to the shelflist and the book entered into the return system to be reshelved.

If no entry for the book is found in the public catalog, or an entry is found with a different call number but no corresponding shelflist entry, the book is sent to cataloging. In this case the entry in the second bibliographic record is deleted or updated to show the status of the book.

If an entry with a different call number is found in the public catalog and a corresponding entry does exist in the shelflist, the book is eventually sent to be relabeled. In addition to checking the search file for those numbers from shelves already inventoried, the call number on the second record is corrected.

Processing of the remaining flagged entries in the second bibliographic record (no shelflist entry and no book found in the stacks) will depend on the nature of the second bibliographic record and other library processes. At the University of Kansas, the record in the circulation database was updated to show that the book was lost. If a book with an OCR number corresponding to that record passed through the circulation system at check out or return, the operator would be alerted to send the book to the inventory staff.

Matching the entries on two sets of bibliographic records requires only one person, and can be performed adequately by clerical employees. The reading performed by the inventory workers at the University of Kansas took an average of one hour per shelflist drawer. The remaining processing of discrepancies also was performed by a clerical employee, spending approximately thirty minutes per shelflist drawer.

## SEARCH PROCEDURES

Throughout the first phase of either type of inventory, shelflist entries for which there are no corresponding books on the shelf are added to a search file. It is not necessary to modify the established library search procedures for the inventory project. Consideration should be given to lengthening the amount of time between the first and subsequent searches.

The number of records initially identified for searching may be quite large and will include many books temporarily off the shelves because they are in use or being reshelved. A search one month after the inventory will probably significantly decrease the number of entries in the search file.

As the inventory proceeds and the search file grows, the portion of inventory staff time devoted to searching will increase. Obviously, the more frequent the searches, the greater the increase. During the inventory at the University of Kansas, the second search was done three months after the first and a third search six months after the second. Established search procedures called for a second and third search at one month intervals from the first.

After the final search, books are declared lost, a procedure that should include notification of cataloging and the appropriate bibliographer, and cards removed from the public catalog. Pulling cards from the public catalog may be done by the catalog maintenance staff or by the inventory staff with review by the catalog maintenance staff. In either case, the cataloging department must be notified so that the shelflist and other records can be updated.

Removing cards for lost books from the public catalog is one of the final goals of the inventory. However, there is often a reluctance to take this final step for fear the books will reappear, requiring costly reinstatement. If the inventory is done in the stacks, misshelved and mismarked books will be located throughout the process. Some of these books will earlier have been identified as missing during the inventory, and eventually declared lost. The library may choose to save the public catalog cards for a specified period of time to avoid recataloging books that are located by the inventory after being declared lost.

Twenty-seven academic libraries that conducted inventories between 1970 and 1980 responded to a question about withdrawing records for books declared lost by the inventory. As Table 1 shows, most libraries searched for materials for at least one year before withdrawing records.

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INSERT TABLE 1

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## RECORD-KEEPING AND STATISTICS

During either inventory process, the most important record-keeping activities center around tracking the progress of each section of the shelflist. Recording statistical information for later use can easily be integrated into the tracking system.

The inventory of each section of the shelflist involves a number of steps. Several sections of the shelflist will be involved in the inventory concurrently, each at a different step in the process. The main requirement of the tracking system is that it provide a method of quickly determining where in the process each section of the shelflist is at all times. A chart listing the steps the of inventory process across the top and sections of the shelflist down the side provides easy access and upkeep. In the example on Sample A, the inventory workers date and initial the appropriate box on the chart as a step is completed. This chart will provide a record for time studies of the inventory. Problems and questions can also be directed to the correct person. Recording statistics on the

## Table 1:

**Time lapse between identifying missing books during inventory and withdrawing records from public catalog**

| Less than one year (8 libraries) | | | | More than one year (19 libraries) | | |
|---|---|---|---|---|---|---|
| less than 3 months | 3 months | 6 months | 9 months | 1 year | 1-2 years | over 2 years |
| 2 | 2 | 2 | 2 | 7 | 10 | 2 |

same shelflist sections alleviates the need to keep up with a second system and provides comparative information. The chart on Sample B is a companion to the tracking chart on Sample A.

The call number breakdowns used for the tracking system and statistics should be based on the divisions of the shelflist being inventoried; for example, the range of numbers in each drawer of a card shelflist. However, some consideration should be given to subject breakdowns that may provide useful information to bibliographers. A common device is to record statistics for call numbers corresponding to subject areas. When developing a statistical recordkeeping form, it is useful to consult with the bibliographers, to insure that the results will be helpful and appropriate for their needs as well. Examples of tabulations produced from partial inventories conducted at the University of Arizona Library in 1977; Olin Library, Cornell University, in 1978; and University of California at San Diego in 1979 and 1980 appear on Samples C through E. All three use some variation of this system.

| | Reading Completed | CIRC Records Checked | Books Processed | 1st Search | 2nd Search | 3d Search | Lost Books Withdrawn |
|---|---|---|---|---|---|---|---|
| 001-099 | 7/8 MS | 7/8 MS | 7/8 NH | 8/12 CH | 11/16 CH | | |
| 100-129 | 7/10 MS | 7/10 NH | 7/11 NH | 8/15 CH | 11/20 MS | | |
| 130-199 | 7/15 NH | 7/16 MS | 7/16 MS | 8/20 CH | 12/1 CH | | |
| 200-209 | 7/18 CH | 7/18 CH | 7/18 NH | 8/23 MS | 12/1 MS | | |
| 210-249 | 7/20 NH | 7/21 NH | 7/21 NH | 8/25 MS | 12/1 MS | | |
| 250-299 | 7/22 CH | 7/22 MS | 7/22 MS | 8/26 NH | | | |
| 300-320 | 7/25 CH | 7/26 MS | 7/26 NH | 8/30 NH | | | |
| 321-341 | 7/29 MS | 7/30 MS | 7/30 NH | 9/8 CH | | | |

TRACKING CHART FOR INVENTORY

SAMPLE A

| | Items Inventoried | Missing Volumes | Volumes Sent To: Branch Libraries | Volumes Sent To: Remarking | Volumes Sent To: Cataloging | Volumes Added To Shelflist | Declared Lost |
|---|---|---|---|---|---|---|---|
| 001-099 | 6289 | 217 | – | 2 | 3 | 3 | |
| 100-129 | 7062 | 310 | – | 1 | 5 | 6 | |
| 130-199 | 6191 | 221 | 3 | – | 1 | – | |
| 200-209 | 1193 | 321 | – | 3 | – | 4 | |
| 210-249 | 1870 | 19 | 1 | 1 | – | 5 | |
| 250-299 | 5990 | 22 | – | – | 5 | 7 | |
| 300-320 | 3504 | 64 | 7 | – | 18 | 7 | |
| 321-341 | 2645 | 99 | – | 1 | 4 | 2 | |

STATISTICS CHART FOR INVENTORY

SAMPLE B

| Call # | Subject | Total units processed | Units missing prior to search | | Units missing post search | | # of titles in B I P, etc. | | Cost of replacement | | Titles to be ordered | | Cost of replacement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | # | % | # | % | # | % of missing | Total | Aver/Vol. | # | % of missing | Total | Aver./Vol. |
| HQ | Family; Marriage | 4627 | 609 | 13.3% | 259 | 6% | 134 | 52% | $1065.51 | $ 7.95 | 58 | 22% | $493.08 | $ 8.50 |
| HT | Communities Races | 1817 | 130 | 7.1% | 50 | 3% | 27 | 54% | $244.80 | $ 9.07 | 20 | 40% | $191.35 | $ 9.57 |
| HJ | Public Finance | 1550 | 57 | 3.7% | 35 | 2.3% | 14 | 40% | $115.85 | $ 8.28 | 10 | 29% | $93.35 | $ 9.34 |
| HD | German History | 902 | 96 | 10.6% | 31 | 3% | 14 | 33% | $265.65 | $19.98 | 12 | 29% | $273.15 | $19.76 |
| PQ | Spanish: Latin Amer Literature | 9319 | 269 | 2.9% | 107 | 1% | 45 | 45% | $ 91.36 | $ 1.98 | 32 | 30% | $ 72.25 | $ 2.26 |
| TR | Photo-graphy | 1032 | 195 | 18.9% | 131 | 13% | 61 | 47% | $814.07 | $13.35 | 42 | 32% | $598.50 | $14.25 |
| HM -HP HR - No 3353 | Sociology | 7095 | 494 | 7% | 279 | 4% | 153 | 55% | $1468.77 | $ 9.60 | 91 | 33% | $840.14 | $ 9.23 |

ARIZONA SAMPLE C



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| | Volumes on Shelf | Volumes in Circulation | Volumes Missing | Total Volumes | Percent Missing |
|---|---|---|---|---|---|
| HX39.5<br>19th Century Including Karl Marx | 211 | 13 | 4 | 228 | 1.75 |
| HX765<br>Kibbutz | 42 | 2 | 0 | 44 | 0 |
| HX806<br>Utopias, The Ideal State. General Works | 67 | 3 | 4 | 74 | 5.41 |
| Subtotals | 448 | 23 | 11 | 482 | 2.28 |
| JC311<br>Nationalism | 128 | 7 | 8 | 143 | 5.59 |
| JC423<br>Democracy | 271 | 11 | 3 | 285 | 1.05 |
| JC491<br>Revolution | 95 | 6 | 3 | 104 | 2.89 |
| JC578<br>Equality Before the Law | 32 | 4 | 1 | 37 | 2.70 |
| Subtotals | 526 | 28 | 15 | 569 | 2.64 |
| JF11<br>English Constitutional History | 21 | 4 | 1 | 26 | 3.85 |
| JF1351<br>Public Administration | 49 | 9 | 1 | 59 | 1.70 |

12/19/79-5/20/80

## INVENTORY STATISTICS

| Call # Range | HD 31 | | RC 480 | | BF 637 | | PN 1993-1999 | | HQ | | N 1 | | NC | | ND | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total # Vols. | 530 | | 320 | | 310 | | 2,225 | | 4,385 | | 1,292 | | 1,780 | | 5,785 | |
| Not on Shelf | 51 | 10 % | 57 | 18% | 85 | 27 % | 806 | 36 % | 1217 | 28 % | 47 | 4% | 355 | 20 % | 1024 | 18 % |
| Found in Circ. | 21 | 4 % | 41 | 13% | 36 | 12 % | 257 | 12 % | 418 | 10 % | 3 | .2% | 14 | .8% | 393 | 7 % |
| Mis-shelved | 16 | 3 % | 5 | 2% | 3 | 1 % | 55 | 2 % | 139 | 3 % | 1 | .08% | 24 | 1 % | 220 | 4 % |
| ON FOLLOW-UP: | 2 | | 2 | | 2 | | 1 | | 2 | | 1 | | 1 | | 1 | |
| Found on Shelf | 7 | 1 % | 0 | --- | 16 | 5 % | 106 | 5 % | 70 | 2 % | 0 | --- | 44 | 2 % | 141 | 2 % |
| Found in Circ. | 1 | .2% | 7 | 2% | 4 | 1 % | 32 | 1 % | 19 | .4% | 0 | --- | 0 | ----- | 80 | 1 % |
| At Bindery | 0 | ----- | 0 | --- | 0 | ----- | 1 | .04% | 0 | ----- | 0 | --- | 0 | ----- | 0 | ------ |
| Still Unaccounted for: | 6 | 1 % | 4 | 1% | 26 | 8 % | 355 | 16 % | 571 | 13 % | 43 | 3% | 273 | 15 % | 190 | 3 % |
| No Shelflist | 5 | .9% | 5 | 2% | 1 | .3% | 6 | .2 % | 37 | .8% | 0 | --- | 8 | .4% | 36 | .6 % |
| Mis-Marked | 0 | ----- | 0 | --- | 0 | ----- | 4 | .2 % | 10 | .2% | 0 | --- | 7 | .4% | 10 | .2 % |
| Repairs/ Rebinds | 0 | ----- | 0 | --- | 0 | ----- | 2 | .09% | 13 | .3% | 0 | --- | 1 | .05% | 5 | .09% |
| Time Spent (hrs.) | 16 | | 8 | | 8 | | 30 | | 47.5 | | 10.5 | | 20.25 | | 44.5 | |
| Cost (3.79/hr) | $60.64 | | $30.32 | | $30.32 | | $113.70 | | $180.03 | | $39.80 | | $76.75 | | $168.66 | |
| Unit cost per book time (time:books) | 1.8 m/bk | | 1.5 m/bk | | 1.6 m/bk | | .8 m/bk | | .7 m/bk | | .4 m/bk | | .7 m/bk | | .5 m/bk | |
| $ amt (cost:books) | 11¢/bk | | 10¢/bk | | 10¢/bk | | 5¢/bk | | 4¢/bk | | 3¢/bk | | 4¢/bk | | 3¢/bk | |



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## CONCLUSION

It is certainly delightful for most librarians to contemplate the day when huge datafiles that provide full-text retrieval are readily available. Clearly the technology for this already exists. But how realistic is large-scale implementation in the near future? Those who think it is close at hand might ask themselves what percentage of library users routinely use automated database searching to retrieve bibliographic citations. Even though this technology has now been readily available for well over a decade, most users are still compelled to employ printed indexes and abstracts. Simple economics have dictated this to be true. These same forces will compel the majority of library users to continue their dependance on materials located in the stacks of their own library or a library that lends to their library, as opposed to obtaining information from full-text databases. What will improve for the majority of library users is access to bibliographic citation databases. One impact of these trends is that it becomes more important than ever for materials be readily locatable in the stacks.

While the ability to locate materials in the stacks has been improved by automated circulation systems, it has been hampered as libraries have grown to unprecedented sizes that discourage inventory projects. Without question, however, this effort to bring the catalog into correspondence with the materials on the shelf is needed now more than ever. With proper administrative support, the cooperation of affected departments, and an efficient approach to inventory procedures, such an effort should be worth considering.

## APPENDIX A

SURVEY OF ACADEMIC RESEARCH LIBRARIES REGARDING INVENTORY PRACTICES (1980)

1. Are you doing or have you done within the past ten years a partial or complete inventory of your holdings?

   ( ) Yes (If yes, please skip to question 5)
   ( ) No

2. Are you planning to do an inventory?

   ( ) Yes (If yes, please skip to question 10)
   ( ) No

3. Have you ever considered doing an inventory?

   ( ) Yes, but decided against it
   ( ) No (If no, please skip to question 17)

4. What were the major factors in your decision not to inventory? (please skip to question 17)

5. What percentage of your holdings has been inventoried in the past ten years?

   ( ) less than 10 percent
   ( ) 10-24 percent
   ( ) 25-49 percent
   ( ) 50-74 percent
   ( ) 75-89 percent
   ( ) 90-100 percent

6. What are the major problems you have encountered in the inventory project?

7. Have you encountered any problems that are more serious in or unique to one classification scheme or subject area.

8. Please indicate, by percentage, the incidence of the following (if estimated, please circle)

| Dewey | LC | Other (please specify_____) | |
|---|---|---|---|
| ____% | ____% | ____% | books that need remarking |
| ____% | ____% | ____% | books with cataloging errors |
| ____% | ____% | ____% | books on shelf recorded as lost or discarded |
| ____% | ____% | ____% | books not on shelf and not checked out |
| ____% | ____% | ____% | other (please specify_____) |

If other or additional statistical information is available concerning your inventory, please return with questionnaire.

9. How are you dealing with books not on shelf and not checked out? (For example, how many searches and at what intervals before declaring lost.)

10. Do you plan to inventory your entire holdings?

( ) Yes (If yes, please skip to question 12)
( ) No

11. What parts of your holdings have you decided not to inventory and why?

12. How long do you estimate it would take to complete an inventory of your entire holdings? (If this is not an estimate, please indicate.) Please indicate number of full time equivalent positions used in estimate.

13. What factors do you see as necessary prerequisites for an inventory project?

14. What do you see as the major advantages of an inventory project?

15. What do you see as the major disadvantages of an inventory project?

16. Do you have any additional comments to make about an inventory you have done in the past ten years or are planning to do?

17. We are also interested in inventories prior to 1970. Please describe, in general terms, what has previously occurred.

18. What is the size of your main library collection? (number of volumes)

19. Are your main library stacks open or closed?

20. How many staff members are assigned to the Circulation Department?

_____ librarians
_____ non-professional staff
_____ full time equivalent of student assistants

SURVEY OF ACADEMIC RESEARCH LIBRARIES REGARDING INVENTORY PRACTICES (1980): SUMMARY OF RESULTS

Have you done a complete or partial inventory of your holdings within the past ten years?

NO (29 libraries)

Planning an inventory (2 libraries)

Considered inventorying but decided against it (12 libraries)

Reasons for deciding against inventory
- lack of staff (6 libraries)
- time involved (3 libraries)
- budget/money/cost (3 libraries)
- size of collection (2 libraries)
- no demonstrable need (1 library)

Have not considered doing an inventory (15 libraries)

YES (32 libraries)

Percentage of collection inventoried
- less than 10 percent (14 libraries)
- 25-49 percent (8 libraries)
- 50-89 percent (5 libraries)
- 90-100 percent (5 libraries)

Percentage of inventoried holdings identified as missing
- less than 1 percent (7 libraries)
- 1-4.9 percent (5 libraries)
- 5-9.9 percent (6 libraries)
- 10 percent or more (4 libraries)

Percentage of inventoried holdings with no record in public catalog
- less than 1 percent (8 libraries)
- 1-2.9 percent (4 libraries)
- 3-5 percent (3 libraries)

Disadvantages of inventory
- Staff required/labor costs (15 libraries)
- Time required to complete (8 libraries)
- Cost (6 libraries)
- None (specifically stated) (6 libraries)
- Other (2 libraries)

Problems encountered during inventory (other than those the inventory is designed to identify)

Impact of inventory on other library department/coordination with technical services

Difficulties with serials because holdings not on shelflist

Tedium of work and unpleasant working conditions (library stacks)

Advantages of inventory (other than correction of records and resulting decrease in user and staff frustration)

Establish loss and growth rates for insurance and security purposes; identify security needs; suggest security measures

Identification of missing items while they are still in print and less expensive to replace

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